

ITCE 300/313: Quiz 1

Student Name:

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- 1- The wave length of a periodic sinusoidal signal with a frequency of 28KHz with a propagation speed of 2×10^8 m/s equals to $\lambda = vT \rightarrow \lambda = v \frac{1}{f} \rightarrow \lambda = (2 \times 10^8) \frac{1}{(28 \times 10^3)} \rightarrow \lambda = 7.1 \text{ K}$.
- 2- Using Nyquist bandwidth formula, $C = 2B \log_2 M \rightarrow C = 2(2.4 \times 10^3) \log_2(2) \rightarrow C = 4800$ is the highest signal rate that can be carried by the signal with frequency of 2.4KHz with $M=2$. And the rate can reach $C = 2(2.4 \times 10^3) \log_2(2 \times 8) \rightarrow C = 19200$ if M is increased to 8 levels.
- 3- In differential encoding, data are represented by **changes** rather than **levels**.
- 4- **Manchester or differential Manchester** is a biphase encoding scheme for digital signals.
- 5- A **Half duplex** link that can transfer data in both direction, but one direction at a time.
- 6- List the advantages of digital transmission
 - **Data integrity.**
 - **Integration.**
 - **Digital technology.**
 - **Security & privacy.**
 - **Capacity utilization.**
- 7- What are the three transmission impairments, list and define each of them
 - a. **Attenuation: Losses of energy when a signal travels through a medium.**
 - b. **Distortion: The signal changes its form or shape.**
 - c. **Noise: An extra signal that generated by a random motion of electrons in a wire.**
- 8- What are the advantages and disadvantages of NRZ

Advantages: Easy for engineers and make good use of bandwidth.

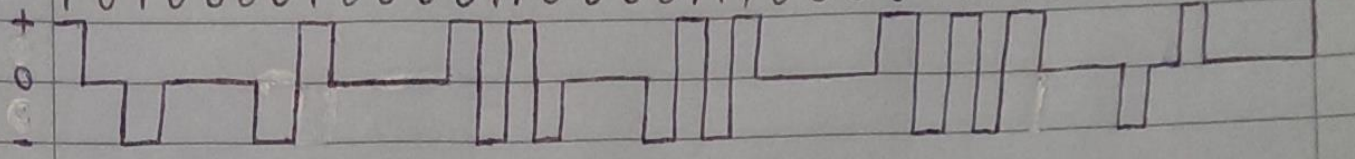
Disadvantages: Lack of synchronization capability.
- 9- Define the guided media, and write down two examples.

Definition: It's a type of communication media in which communication devices are directly linked with each other via cables or physical media.

Examples: Twister pair cable, coaxial cable and fiber optic cable.

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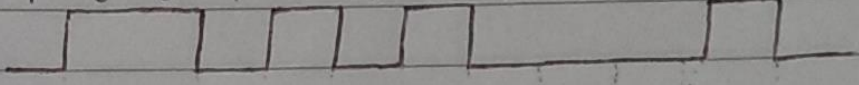
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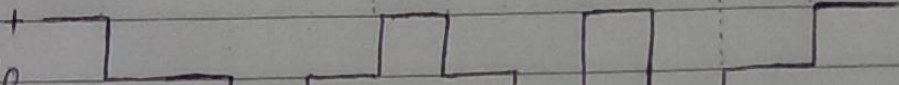
NRZ-L:



NRZI:



Bipolar.



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